

CS2015-2018 Study Group

CS10720 Binary, Decimal and Hexadecimal Gadd's Guide

First Year Module Exam Content

This document contains useful material to be printed out and taken into the CS10720 Problems and Solutions open book exam. This document provides conversions from Decimal to Hexadecimal (for Positive numbers), Binary (Signed magnitude for Negative numbers), One's compliment and Two's complement.

This document is split into 2 parts - one for positive numbers and one for negative numbers.

Positive Numbers

Decimal	Hexadecimal	Binary	One's compliment	Two's Complimen
0	0	00000000	00000000	00000000
1	1	00000001	00000001	00000001
2	2	00000010	00000010	00000010
3	3	00000011	00000011	00000011
4	4	00000100	00000100	00000100
5	5	00000101	00000101	00000101
6	6	00000110	00000110	00000110
7	7	00000111	00000111	00000111
8	8	00001000	00001000	00001000
9	9	00001001	00001001	00001001
10	A	00001010	00001010	00001010
11	B	00001011	00001011	00001011
12	C	00001100	00001100	00001100
13	D	00001101	00001101	00001101
14	E	00001110	00001110	00001110
15	F	00001111	00001111	00001111
16	10	00010000	00010000	00010000
17	11	00010001	00010001	00010001
18	12	00010010	00010010	00010010
19	13	00010011	00010011	00010011
20	14	00010100	00010100	00010100
21	15	00010101	00010101	00010101
22	16	00010110	00010110	00010110
23	17	00010111	00010111	00010111
24	18	00011000	00011000	00011000
25	19	00011001	00011001	00011001
26	1A	00011010	00011010	00011010
27	1B	00011011	00011011	00011011
28	1C	00011100	00011100	00011100
29	1D	00011101	00011101	00011101
30	1E	00011110	00011110	00011110
31	1F	00011111	00011111	00011111
32	20	00100000	00100000	00100000
33	21	00100001	00100001	00100001
34	22	00100010	00100010	00100010
35	23	00100011	00100011	00100011
36	24	00100100	00100100	00100100
37	25	00100101	00100101	00100101
38	26	00100110	00100110	00100110
39	27	00100111	00100111	00100111

Positive Numbers

Decimal	Hexadecimal	Binary	One's compliment	Two's Complimen
40	28	00101000	00101000	00101000
41	29	00101001	00101001	00101001
42	2A	00101010	00101010	00101010
43	2B	00101011	00101011	00101011
44	2C	00101100	00101100	00101100
45	2D	00101101	00101101	00101101
46	2E	00101110	00101110	00101110
47	2F	00101111	00101111	00101111
48	30	00110000	00110000	00110000
49	31	00110001	00110001	00110001
50	32	00110010	00110010	00110010
51	33	00110011	00110011	00110011
52	34	00110100	00110100	00110100
53	35	00110101	00110101	00110101
54	36	00110110	00110110	00110110
55	37	00110111	00110111	00110111
56	38	00111000	00111000	00111000
57	39	00111001	00111001	00111001
58	3A	00111010	00111010	00111010
59	3B	00111011	00111011	00111011
60	3C	00111100	00111100	00111100
61	3D	00111101	00111101	00111101
62	3E	00111110	00111110	00111110
63	3F	00111111	00111111	00111111
64	40	01000000	01000000	01000000
65	41	01000001	01000001	01000001
66	42	01000010	01000010	01000010
67	43	01000011	01000011	01000011
68	44	01000100	01000100	01000100
69	45	01000101	01000101	01000101
70	46	01000110	01000110	01000110
71	47	01000111	01000111	01000111
72	48	01001000	01001000	01001000
73	49	01001001	01001001	01001001
74	4A	01001010	01001010	01001010
75	4B	01001011	01001011	01001011
76	4C	01001100	01001100	01001100
77	4D	01001101	01001101	01001101
78	4E	01001110	01001110	01001110
79	4F	01001111	01001111	01001111

Positive Numbers

Decimal	Hexadecimal	Binary	One's compliment	Two's Complimen
80	50	01010000	01010000	01010000
81	51	01010001	01010001	01010001
82	52	01010010	01010010	01010010
83	53	01010011	01010011	01010011
84	54	01010100	01010100	01010100
85	55	01010101	01010101	01010101
86	56	01010110	01010110	01010110
87	57	01010111	01010111	01010111
88	58	01011000	01011000	01011000
89	59	01011001	01011001	01011001
90	5A	01011010	01011010	01011010
91	5B	01011011	01011011	01011011
92	5C	01011100	01011100	01011100
93	5D	01011101	01011101	01011101
94	5E	01011110	01011110	01011110
95	5F	01011111	01011111	01011111
96	60	01100000	01100000	01100000
97	61	01100001	01100001	01100001
98	62	01100010	01100010	01100010
99	63	01100011	01100011	01100011
100	64	01100100	01100100	01100100
101	65	01100101	01100101	01100101
102	66	01100110	01100110	01100110
103	67	01100111	01100111	01100111
104	68	01101000	01101000	01101000
105	69	01101001	01101001	01101001
106	6A	01101010	01101010	01101010
107	6B	01101011	01101011	01101011
108	6C	01101100	01101100	01101100
109	6D	01101101	01101101	01101101
110	6E	01101110	01101110	01101110
111	6F	01101111	01101111	01101111
112	70	01110000	01110000	01110000
113	71	01110001	01110001	01110001
114	72	01110010	01110010	01110010
115	73	01110011	01110011	01110011
116	74	01110100	01110100	01110100
117	75	01110101	01110101	01110101
118	76	01110110	01110110	01110110
119	77	01110111	01110111	01110111

Positive Numbers

Decimal	Hexadecimal	Binary	One's compliment	Two's Complimen
120	78	01111000	01111000	01111000
121	79	01111001	01111001	01111001
122	7A	01111010	01111010	01111010
123	7B	01111011	01111011	01111011
124	7C	01111100	01111100	01111100
125	7D	01111101	01111101	01111101
126	7E	01111110	01111110	01111110
127	7F	01111111	01111111	01111111
128	80	10000000	10000000	10000000
129	81	10000001	10000001	10000001
130	82	10000010	10000010	10000010
131	83	10000011	10000011	10000011
132	84	10000100	10000100	10000100
133	85	10000101	10000101	10000101
134	86	10000110	10000110	10000110
135	87	10000111	10000111	10000111
136	88	10001000	10001000	10001000
137	89	10001001	10001001	10001001
138	8A	10001010	10001010	10001010
139	8B	10001011	10001011	10001011
140	8C	10001100	10001100	10001100
141	8D	10001101	10001101	10001101
142	8E	10001110	10001110	10001110
143	8F	10001111	10001111	10001111
144	90	10010000	10010000	10010000
145	91	10010001	10010001	10010001
146	92	10010010	10010010	10010010
147	93	10010011	10010011	10010011
148	94	10010100	10010100	10010100
149	95	10010101	10010101	10010101
150	96	10010110	10010110	10010110
151	97	10010111	10010111	10010111
152	98	10011000	10011000	10011000
153	99	10011001	10011001	10011001
154	9A	10011010	10011010	10011010
155	9B	10011011	10011011	10011011
156	9C	10011100	10011100	10011100
157	9D	10011101	10011101	10011101
158	9E	10011110	10011110	10011110
159	9F	10011111	10011111	10011111

Positive Numbers

Decimal	Hexadecimal	Binary	One's compliment	Two's Complimen
160	A0	10100000	10100000	10100000
161	A1	10100001	10100001	10100001
162	A2	10100010	10100010	10100010
163	A3	10100011	10100011	10100011
164	A4	10100100	10100100	10100100
165	A5	10100101	10100101	10100101
166	A6	10100110	10100110	10100110
167	A7	10100111	10100111	10100111
168	A8	10101000	10101000	10101000
169	A9	10101001	10101001	10101001
170	AA	10101010	10101010	10101010
171	AB	10101011	10101011	10101011
172	AC	10101100	10101100	10101100
173	AD	10101101	10101101	10101101
174	AE	10101110	10101110	10101110
175	AF	10101111	10101111	10101111
176	B0	10110000	10110000	10110000
177	B1	10110001	10110001	10110001
178	B2	10110010	10110010	10110010
179	B3	10110011	10110011	10110011
180	B4	10110100	10110100	10110100
181	B5	10110101	10110101	10110101
182	B6	10110110	10110110	10110110
183	B7	10110111	10110111	10110111
184	B8	10111000	10111000	10111000
185	B9	10111001	10111001	10111001
186	BA	10111010	10111010	10111010
187	BB	10111011	10111011	10111011
188	BC	10111100	10111100	10111100
189	BD	10111101	10111101	10111101
190	BE	10111110	10111110	10111110
191	BF	10111111	10111111	10111111
192	C0	11000000	11000000	11000000
193	C1	11000001	11000001	11000001
194	C2	11000010	11000010	11000010
195	C3	11000011	11000011	11000011
196	C4	11000100	11000100	11000100
197	C5	11000101	11000101	11000101
198	C6	11000110	11000110	11000110
199	C7	11000111	11000111	11000111

Positive Numbers

Decimal	Hexadecimal	Binary	One's compliment	Two's Complimen
200	C8	11001000	11001000	11001000
201	C9	11001001	11001001	11001001
202	CA	11001010	11001010	11001010
203	CB	11001011	11001011	11001011
204	CC	11001100	11001100	11001100
205	CD	11001101	11001101	11001101
206	CE	11001110	11001110	11001110
207	CF	11001111	11001111	11001111
208	D0	11010000	11010000	11010000
209	D1	11010001	11010001	11010001
210	D2	11010010	11010010	11010010
211	D3	11010011	11010011	11010011
212	D4	11010100	11010100	11010100
213	D5	11010101	11010101	11010101
214	D6	11010110	11010110	11010110
215	D7	11010111	11010111	11010111
216	D8	11011000	11011000	11011000
217	D9	11011001	11011001	11011001
218	DA	11011010	11011010	11011010
219	DB	11011011	11011011	11011011
220	DC	11011100	11011100	11011100
221	DD	11011101	11011101	11011101
222	DE	11011110	11011110	11011110
223	DF	11011111	11011111	11011111
224	E0	11100000	11100000	11100000
225	E1	11100001	11100001	11100001
226	E2	11100010	11100010	11100010
227	E3	11100011	11100011	11100011
228	E4	11100100	11100100	11100100
229	E5	11100101	11100101	11100101
230	E6	11100110	11100110	11100110
231	E7	11100111	11100111	11100111
232	E8	11101000	11101000	11101000
233	E9	11101001	11101001	11101001
234	EA	11101010	11101010	11101010
235	EB	11101011	11101011	11101011
236	EC	11101100	11101100	11101100
237	ED	11101101	11101101	11101101
238	EE	11101110	11101110	11101110
239	EF	11101111	11101111	11101111

Positive Numbers

Decimal	Hexadecimal	Binary	One's compliment	Two's Complimen
240	F0	11110000	11110000	11110000
241	F1	11110001	11110001	11110001
242	F2	11110010	11110010	11110010
243	F3	11110011	11110011	11110011
244	F4	11110100	11110100	11110100
245	F5	11110101	11110101	11110101
246	F6	11110110	11110110	11110110
247	F7	11110111	11110111	11110111
248	F8	11111000	11111000	11111000
249	F9	11111001	11111001	11111001
250	FA	11111010	11111010	11111010
251	FB	11111011	11111011	11111011
252	FC	11111100	11111100	11111100
253	FD	11111101	11111101	11111101
254	FE	11111110	11111110	11111110
255	FF	11111111	11111111	11111111
256	100	100000000	100000000	100000000
257	101	100000001	100000001	100000001
258	102	100000010	100000010	100000010

Negative Numbers

Decimal	Binary	One's complime	Two's Compliment
0	00000000	11111111	00000000
-1	10000001	11111110	11111111
-2	10000010	11111101	11111110
-3	10000011	11111100	11111101
-4	10000100	11111011	11111100
-5	10000101	11111010	11111011
-6	10000110	11111001	11111010
-7	10000111	11111000	11111001
-8	10001000	11110111	11111000
-9	10001001	11110110	11110111
-10	10001010	11110101	11110110
-11	10001011	11110100	11110101
-12	10001100	11110011	11110100
-13	10001101	11110010	11110011
-14	10001110	11110001	11110010
-15	10001111	11110000	11110001
-16	10010000	11101111	11110000
-17	10010001	11101110	11101111
-18	10010010	11101101	11101110
-19	10010011	11101100	11101101
-20	10010100	11101011	11101100
-21	10010101	11101010	11101011
-22	10010110	11101001	11101010
-23	10010111	11101000	11101001
-24	10011000	11100111	11101000
-25	10011001	11100110	11100111
-26	10011010	11100101	11100110
-27	10011011	11100100	11100101
-28	10011100	11100011	11100100
-29	10011101	11100010	11100011
-30	10011110	11100001	11100010
-31	10011111	11100000	11100001
-32	10100000	11011111	11100000
-33	10100001	11011110	11011111
-34	10100010	11011101	11011110
-35	10100011	11011100	11011101
-36	10100100	11011011	11011100

Negative Numbers

Decimal	Binary	One's complime	Two's Compliment
-37	10100101	11011010	11011011
-38	10100110	11011001	11011010
-39	10100111	11011000	11011001
-40	10101000	11010111	11011000
-41	10101001	11010110	11010111
-42	10101010	11010101	11010110
-43	10101011	11010100	11010101
-44	10101100	11010011	11010100
-45	10101101	11010010	11010011
-46	10101110	11010001	11010010
-47	10101111	11010000	11010001
-48	10110000	11001111	11010000
-49	10110001	11001110	11001111
-50	10110010	11001101	11001110
-51	10110011	11001100	11001101
-52	10110100	11001011	11001100
-53	10110101	11001010	11001011
-54	10110110	11001001	11001010
-55	10110111	11001000	11001001
-56	10111000	11000111	11001000
-57	10111001	11000110	11000111
-58	10111010	11000101	11000110
-59	10111011	11000100	11000101
-60	10111100	11000011	11000100
-61	10111101	11000010	11000011
-62	10111110	11000001	11000010
-63	10111111	11000000	11000001
-64	11000000	10111111	11000000
-65	11000001	10111110	10111111
-66	11000010	10111101	10111110
-67	11000011	10111100	10111101
-68	11000100	10111011	10111100
-69	11000101	10111010	10111011
-70	11000110	10111001	10111010
-71	11000111	10111000	10111001
-72	11001000	10110111	10111000
-73	11001001	10110110	10110111

Negative Numbers

Decimal	Binary	One's complime	Two's Compliment
-74	11001010	10110101	10110110
-75	11001011	10110100	10110101
-76	11001100	10110011	10110100
-77	11001101	10110010	10110011
-78	11001110	10110001	10110010
-79	11001111	10110000	10110001
-80	11010000	10101111	10110000
-81	11010001	10101110	10101111
-82	11010010	10101101	10101110
-83	11010011	10101100	10101101
-84	11010100	10101011	10101100
-85	11010101	10101010	10101011
-86	11010110	10101001	10101010
-87	11010111	10101000	10101001
-88	11011000	10100111	10101000
-89	11011001	10100110	10100111
-90	11011010	10100101	10100110
-91	11011011	10100100	10100101
-92	11011100	10100011	10100100
-93	11011101	10100010	10100011
-94	11011110	10100001	10100010
-95	11011111	10100000	10100001
-96	11100000	10011111	10100000
-97	11100001	10011110	10011111
-98	11100010	10011101	10011110
-99	11100011	10011100	10011101
-100	11100100	10011011	10011100
-101	11100101	10011010	10011011
-102	11100110	10011001	10011010
-103	11100111	10011000	10011001
-104	11101000	10010111	10011000
-105	11101001	10010110	10010111
-106	11101010	10010101	10010110
-107	11101011	10010100	10010101
-108	11101100	10010011	10010100
-109	11101101	10010010	10010011
-110	11101110	10010001	10010010

Negative Numbers

Decimal	Binary	One's complime	Two's Compliment
-111	11101111	10010000	10010001
-112	11110000	10001111	10010000
-113	11110001	10001110	10001111
-114	11110010	10001101	10001110
-115	11110011	10001100	10001101
-116	11110100	10001011	10001100
-117	11110101	10001010	10001011
-118	11110110	10001001	10001010
-119	11110111	10001000	10001001
-120	11111000	10000111	10001000
-121	11111001	10000110	10000111
-122	11111010	10000101	10000110
-123	11111011	10000100	10000101
-124	11111100	10000011	10000100
-125	11111101	10000010	10000011
-126	11111110	10000001	10000010
-127	11111111	10000000	10000001
-128	110000000	101111111	110000000